

## **PUBLIC ABSTRACT**

Applicant (primary) name: Southern Company Services, Inc.  
Applicant's address: 600 North 18<sup>th</sup> Street Birmingham AL 35291  
Street City State Zipcode

Team Members (if any): Southern Co. Svcs. Birmingham AL 35291  
(listing represents only participants  
at time of application, not necessarily  
final team membership) Name City State Zipcode

Peabody Energy St. Louis MO 63101  
Name City State Zipcode

Kellogg Brown and Root Houston TX 77002  
Name City State Zipcode  
(Use continuation sheet if needed.)

Proposal Title: 300-MW Demonstration of Coal Gasification Power  
Generation, Incorporating an Air-Blown KBR Transport  
Gasifier

Commercial Application: ☒ New Facilities ☒ Existing Facilities  
\_ Other, Specify:

Technology Type: Conversion (Gasification)

Estimated total cost of project:  
(May not represent final negotiated costs.)

Total Estimated Cost:	\$ 719,506,512
Estimated DOE Share:	\$ 250,000,000
Estimated Private Share:	\$ 469,506,512

## **PUBLIC ABSTRACT (cont'd)**

### **Anticipated Project Site(s):**

Greene County AL 36732  
Location (city, county, etc.) State Zipcode

McKinley County NM 87020  
Location (city, county, etc.) State Zipcode

McKinley County NM 87013  
Location (city, county, etc.) State Zipcode

Randolph County IL 62286  
Location (city, county, etc.) State Zipcode

Warrick County IN 47619  
Location (city, county, etc.) State Zipcode

### **Type of coal to be used:**

U.S. PRB (sub-bituminous) U.S. Bituminous  
Primary Alternate (if any)

### **Size or scale of project:** 3322

Tons of coal/day input

### **And/or**

297 MW Megawatts, Barrels per day, etc.  
Other (if necessary)

### **Duration of proposed project:** 112 (From date of award) (Months)

### **PRIMARY CONTACT:**

For additional information,  
interested parties should contact:

Randall Rush  
Name

( 205 ) 670-5842  
Telephone Number

rerush@southernco.com  
e-mail address

Director – Power Systems Development Facility  
Position

Southern Company Services, Inc.  
Company

P.O. Box 1069  
Address

Wilsonville AL 35186  
City State Zipcode

### **Alternative Contact:**

Tim Pinkston  
Name

( 205 ) 670-5860  
Telephone Number

tepinkst@southernco.com  
e-mail address

Tech. Mgr. – Power Systems Development  
Facility  
Position

Southern Company Services, Inc.  
Company

P.O. Box 1069  
Address

Wilsonville AL 35186  
City State Zipcode

## **PUBLIC ABSTRACT (cont'd)**

### **Brief description of project:**

Demonstration of an air-blown transport reactor integrated gasification (TRIG™) combined cycle power plant is proposed. The transport reactor design is based on Kellogg Brown and Root's fluidized catalytic cracker technology used successfully for over 50 years in the petroleum refining industry to produce gasoline from middle distillates.

The demonstration unit will generate 297 MW (net) at 44.4 percent efficiency (LHV), a heat rate of 7,680 Btu/kWh. It will be the cleanest, and when adjusted for local conditions, most efficient coal-fired power plant technology in the world. The demonstration unit design involves a single gasifier/gas turbine train and one steam turbine. This configuration is sometimes referred to as 1-on-1. Following demonstration at this size, scale up to a more economical 600 MW 2-on-1 configuration can be achieved at no risk since only the steam turbine will increase in size.

The gasifier is fed with nominally 140 tons/hr of sub-bituminous coal and 4 tons/hr of limestone for in-situ sulfur capture. Syngas with a nominal heating value of 110 Btu/SCF is fired in a General Electric 7FA turbine generating 197 MW. The gas turbine flue gas discharges into a single pressure, heat recovery steam generator (HRSG). High-pressure saturated steam raised in the HRSG is mixed with steam from a syngas cooler, superheated in the HRSG and expanded through a reheat steam turbine operating at 1,815 psia/1,000°F/1,000°F. The steam turbine output is 118 MW.

Within the HRSG, a unit for selective catalytic reduction (SCR) of NO<sub>x</sub> is installed after the evaporator circuit where the flue gas is in the optimal temperature range of 600 to 700°F. After the HRSG, the flue gas passes through a flue gas treatment (FGT) unit that incorporates a proprietary Southern Company modification that lowers emissions. This FGT unit removes almost all the environmental species of interest, including sulfur dioxide and trioxide, hydrogen chloride, hydrogen fluoride, ammonia slip from the SCR unit, oxidized and unoxidized mercury, trace elements, and volatile organic compounds. Char and ash are removed from the gasifier island, water is added for dust suppression, and the mixture is disposed of in a landfill that is designed to collect and recycle rainfall for use in the demonstration unit. Tests show that the char and ash from the gasifier are non-hazardous.